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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,944	11/28/2001	Stefan Davidsson	4015-6	7288
23117	7590	01/05/2006	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			WONG, BLANCHE	
			ART UNIT	PAPER NUMBER
			2667	

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/994,944	Applicant(s) DAVIDSSON ET AL.	
	Examiner Blanche Wong	Art Unit 2667	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 2-24, 26-30, 32-52 and 54-58 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-13, 23, 24, 32-42, 51 and 52 is/are allowed.
- 6) ☒ Claim(s) 14, 26-30, 43 and 54-58 is/are rejected.
- 7) ☒ Claim(s) 15-22 and 44-50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>Oct'05</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Examiner notes that claim 58 depend from a cancelled claim 53.

#### ***Claim Objections***

2. Claim 23 is objected to because of the following informalities:

With respect to claim 23, Examiner suggests removing – and – in ln. 7, in consistent with claim 24 and 14, and removing the extra semicolon in ln. 9.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 27-30** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 27-30, all in ln. 1, it is unclear whether the apparatus of claim 26 is the same as the radio receiver system of claim 26.

5. **Claims 27-30** recite the limitation "The apparatus of claim 26" all in ln. 1. There is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Art Unit: 2667

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 14 and 43** are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Castelain (U.S. Pat NO. 6,876,672).

With regard to claims 14 and 43, Castelain discloses (see Fig. 1) a radio receiver 20 which receives (receiving unit 27, col. 2, ln. 38) plural (a plurality of sub-carriers with distinct respective frequencies, col. 1, ln. 56-57 and col. 2, ln. 27-31) modulated (see signal coding/modulation 12)(modulation signals, col. 1, ln. 45) radio frequency carriers and produces therefrom a modulated base-band (col. 2, ln. 38) signal, the plurality modulated radio frequency carriers having been transmitted by a radio transmitter 10 operating in accordance with a transmitter sample clock 16 (time base, col. 2, ln. 31);

a receiver sample clock 26 (time base, col. 2, ln. 41-42) which is used for sampling the modulated base-band signal;

a timing correction unit (correcting, col. 5, ln. 40)(determining unit 28, col. 5, ln. 31, in combination with estimation unit 23 and phase shift generator 30, col. 5, ln. 38-42) which performs in the frequency domain (determining ... at a frequency which is related to the receiver sampling frequency, an analysis window, col. 5, ln. 32-34) a timing drift compensation (not only the effect of the transmission channel, but also the phase shift which is related to the position of the analysis window and its drift, col. 5, ln. 39-41) between the transmitter sample clock (transmitter sampling frequency, col. 5, ln. 47-48) and the receiver sample clock (receiver sampling frequency, col. 5, ln. 50);

wherein the timing drift compensation is performed based on frequency offset estimation (phase shift which is related to the position of the analysis window and its drift) and wherein a timing drift compensation value is applied to a frequency domain

modulated subcarrier signal (a plurality of sub-carriers with distinct respective frequencies, col. 1, ln. 56-57)(see also sampling frequency of the analysis window)(see also "an estimation of the deviation of the receiver sampling frequency with respect to the transmitter sampling frequency", col. 5, ln. 46-48).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 26,30,54,58** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo et al. (U.S. Pat No. 5,959,965) in view of Yu et al. (U.S. Pat No. 6,735,454).

With regard to cl. 26 and 54, Ohkubo discloses a radio receiver (see Fig. 3) which receives plural modulated radio frequency carriers (OFDM signal, col. 13, ln. 63) and produces therefrom a modulated base-band signal (col. 13, ln. 60-col. 14, ln. 12), the plural modulated radio frequency carriers having been transmitted by a radio transmitter operating in accordance with a transmitter sample clock (it is inherent that there is a transmitter of the OFDM signal and it has a transmitter clock because the OFDM signal is sent according to an RF frequency band, col. 13, ln. 63);

a receiver sample clock (oscillator 10, col. 13, ln. 66) which is used for sampling the modulated base-band signal;

a frequency offset estimation unit 16 (frequency deviation detector including its input from 101, col. 14, ln. 13-32) which outputs a frequency offset estimation (see output of frequency deviation detector or W, col. 31);

a controller (timing controller 19 in combination with its inputs from frequency deviation detector 16 and timing variation detector 18) which uses the frequency offset estimation to determine an estimated relative sample clock offset (see output of timing controller into symbol selector 15; see adjustment, col.14, ln. 54-56), the estimated relative sample clock offset being an offset between the receiver sample clock and the transmitter sample clock.

However, Ohkubo fails to explicitly show a sleep mode controller which further determines a timing drift during a sleep period of a predetermined duration, as recited in claim 26.

In an analogous art, Yu discloses a sleep mode controller (see Fig. 2; see also Fig. 1) which further determines a timing drift (an additional adjustment factor for adjusting the wake up time to compensate for an offset between the beginning of the sleep period and a first counted clock cycle of the sleep-mode clock ..., col. 6, ln. 28-31) during a sleep period of a predetermined duration. (See also the offset time compensation unit 112) Yu also discloses a time estimation unit 108 and a frequency drift compensation unit 110.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include a sleep mode controller which further determines a timing drift during a sleep period of a predetermined duration. The suggestion/motivation for doing

so would have been to provide a system which compensates for the initial and final offsets to re-activate the higher frequency clock to be reactivated based upon fractional portions of the low frequency clock. Yu, col. 4, ln. 17-20. Therefore, it would have been obvious to combine Yu with Okhubo for the benefit of a sleep mode controller which further determines a timing drift during a sleep period of a predetermined duration, to obtain the invention as specified in claims 26 and 54.

With regard to claims 30 and 58, both Okhubo further discloses OFDM, col. 8, ln. 26.

10. **Claims 27-29,55-57** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo and Yu as applied to claims 26,30,54,58 above, and further in view of Castelain.

With regard to claims 27 and 55, the combination of Okhubo and Yu discloses the system and method of claims 26 and 54 respectively. However, the combination fails to explicitly show a time until which the receiver is to sleep.

Castelain discloses a time estimation unit 108 for estimating the end of a sleep period (see also col. 6, ln. 20-21).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include a time until which the receiver is to sleep. The suggestion/motivation for doing so would have been to implement a method which makes it possible to correct the sampling frequency shift and which facilitates, the implementation of the synchronization of the receiver of an OFDM system, or which can

even make it possible to dispense with the slaving of the sampling frequency.

Castelain, col. 3, ln. 61-65. Therefore, it would have been obvious to combine Casteliain with the combination of Okhubo and Yu for the benefit of a time until which the receiver is to sleep, to obtain the invention as specified in claims 27 and 55.

With regard to claims 28 and 56, the combination of Okhubo and Yu discloses the system and method of claims 26 and 54 respectively. However, the combination fails to explicitly show a time until which the receiver is to search for a start of a frame.

Castelain discloses a time until which the receiver is to search for a start of a frame (sampling frequency and analysis window, col. 5, ln. 34).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art that there is a start of a frame within sampling frequency range at the beginning of the analysis window. The suggestion/motivation for doing so would have been to implement a method which makes it possible to correct the sampling frequency shift and which facilitates, the implementation of the synchronization of the receiver of an OFDM system, or which can even make it possible to dispense with the slaving of the sampling frequency. Castelain, col. 3, ln. 61-65. Therefore, it would have been obvious to combine Casteliain with the combination of Okhubo and Yu for the benefit of a time until which the receiver is to sleep, to obtain the invention as specified in claims 28 and 56.



With regard to claims 29 and 57, the combination of Okhubo and Yu discloses the system and method of claims 26 and 54 respectively. However, the combination fails to explicitly show a size of a start of frame search window.

Castelain discloses a size of a start of frame search window (sampling frequency and analysis window, col. 5, ln. 34).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art that there is a range and thus size of a start of a frame within sampling frequency range at the beginning of the analysis and thus search window. The suggestion/motivation for doing so would have been to implement a method which makes it possible to correct the sampling frequency shift and which facilitates, the implementation of the synchronization of the receiver of an OFDM system, or which can even make it possible to dispense with the slaving of the sampling frequency. Castelain, col. 3, ln. 61-65. Therefore, it would have been obvious to combine Castelain with the combination of Okhubo and Yu for the benefit of a time until which the receiver is to sleep, to obtain the invention as specified in claims 29 and 57.

***Allowable Subject Matter***

11. **Claims 2-13,23-24,32-42,51-52** are allowed.
12. Claims 15-22,44-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cupo et al. (U.S. Pat No. 6,961,393) discloses a transmitter 14, a receiver 18, both include a clock, col. 4, ln. 30, a modulated signal 17, an offset correcting circuit 30, and a correlator 32. Wilkinson (U.S. Pat No. 6,473,453) discloses a frequency correction circuit 123, frequency offset detector 124, and FFT circuit 125 operating at sub-carrier frequencies, col. 6, ln. 42. Lee (U.S. Pat No. 6,373,861) discloses frequency corrector 161 and OFDM, col. 6, ln. 57. However, Cupo, Wilkinson, or Lee does not include the extent of components of claims 4,23,34,51.


14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blanche Wong whose telephone number is 571-272-3177. The examiner can normally be reached on Monday through Friday, 830am to 530pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BW

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December 27, 2005

  
CHI PHAM  
SUPERVISORY PATENT EXAMINER  
1/4/06